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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/844,484

04/27/2001

Gary A. Evans

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10/24/2002

Duke W Yee
Carstens Yee & Cahoon LLP
P O Box 802334
Dallas, TX 75380

EXAMINER

INZIRILLO, GIOACCHINO

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 10/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/844,484

Applicant(s)

EVANS ET AL.

Examiner

Gioacchino Inzirillo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.


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Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1 – 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims fail to recite sufficient structure to support the invention.

Claim 1 recites a semiconductor laser in the preamble, and a waveguide with an outcoupling in the body of the claim. However, no structure to support a semiconductor laser is recited, nor is there any structural relationship recited to tie together the laser and the waveguide.

Claim 7 recites a semiconductor laser in the preamble, and a waveguide, first and second sets of electrodes, and an outcoupling in the body of the claim. However, no structure to support a semiconductor laser is recited, nor is there any structural relationship recited to tie together the laser and the waveguide.

Claim 14 recites a semiconductor laser in the preamble, and a cavity with an outcoupler and a gain region in the body of the claim. However, no structure to support a semiconductor laser is recited, nor is there any structural relationship recited to tie together the laser and the cavity.

Claim 21 recites semiconductor laser system in the preamble, and a cavity with an outcoupling aperture, gain region and reflective layer. However, no structure to support a

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semiconductor laser is recited, nor is there any structural relationship recited to tie together the laser and the cavity.

Claim 27 recites semiconductor laser system in the preamble, and a cavity with an outcoupling aperture, gain region and reflective layer. However, no structure to support a semiconductor laser is recited, nor is there any structural relationship recited to tie together the laser and the cavity.

The lack of this structure renders these claims and all dependant claims indefinite. The following Rejection on the merits is issued in light of this indefiniteness.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 2, 4 – 9, 12 – 15, 17, 18, 20, 21, 23 and 25 – 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ono US 5,088,097 (herein after known as Ono) in view of Lo US 5,491,710 (herein after known as Lo) and Miyake et al. US 5,515,354 (herein after known as Miyake). Ono teaches in Fig. 3 a semiconductor laser with a waveguide portion 20. The waveguide region 20 has two reflectors made up of two gratings 18 and 18'. The gratings are distributed Bragg reflectors, and are seen to vary laterally and longitudinally with respect to the cavity. Ono has a first set of electrodes made up of electrodes 16 and 17 to modulate the light. Ono has a second set of electrodes made up of electrodes 15 and 17. Ono has an active region 12 located between the reflectors. As is evident in Fig. 3 Ono, the gain region has a plurality of sections. One of the sections is a modulation portion that adjusts the phase of the light.

Ono fails to teach first order gratings. However, Lo teaches first order gratings. See Lo Fig. 11, reference numeral 110, and column 7 lines 27 – 30. Lo states that the reason he use the first order gratings as reflectors in a cavity is because the efficiency they lend a system. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ono with the first order gratings as taught by Lo. Furthermore, Lo shows in Fig. 11 that the gratings each have a portion that act as outcoupling apertures. The emitted light λ_1 and λ_2 indicate where the outcoupling aperture portions are. λ_1 and λ_2 are out coupled normal to the surface of the laser. Since the outcoupling gratings and not past the outer edges of the gratings, they can be considered to be between the gratings. The gratings reflective properties are such that they emit only a first order beam, while the second order and higher are reflected downwards.

Both Ono and Lo fail to teach a reflective layer positioned on the outcoupling aperture. Nor do they teach a holographic element. However, Miyake teaches these limitations. Fig. 1 of Miyake shows the outcoupling aperture A being used in a laser system. A close up view is shown in Fig. 2. The outcoupling aperture 2 is comprised by a grating 13a made on the surface 13 of a substrate. The back of the substrate has a reflective coating 20. Column 4, lines 22 – 35, describe the aperture. Therein Miyake describes the element as a holographic mirror 12. Miyake does not mention that the reflective layer is made of a dielectric material. However, dielectric reflective layers are very well known. One could be easily substituted for the metal reflective layer of Miyake. As for reflecting the light downwards, the direction is arbitrary. If the substrate 10 of Fig. 1 of Miyake were below the holographic element, the holographic element could be oriented to direct the beam to the substrate just by turning it. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ono in view of Lo as taught by Miyake.

Regarding claims 13 and 26, due the proceeding under *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA) it is held that it is making use of a one piece construction in stead of discreet parts would be obvious to one of ordinary skill in the art.

Claims 3, 10 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ono in view of Lo and Miyake as applied to claims 1, 2, 4 – 9, 12 – 15, 17, 18, 20, 21, 23 and 25 – 28 above, and further in view of Strasser et al. US 5,363,226 (herein after known as Strasser). Ono in view of Lo teaches the invention as outlined in the rejection above, but fails to teach a light outcoupling angle other than a normal angle. However, Strasser teaches this in Fig. 1 of his patent. Surface grating 11 in Fig. 1 shows a reflection of other than a normal angle. Gratings can

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be designed to reflect light in this way. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ono in view of Lo as taught by Strasser since it is known in the art to do so. Furthermore, the grating has a non-circular footprint.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ono in view of Lo and Miyake as applied to claims 1, 2, 4 – 9, 12 – 15, 17, 18, 20, 21, 23 and 25 – 28 above, and further in view of Mueller US 5,153,935 (herein after known as Mueller). Ono in view of Lo and Miyake teaches the invention as outlined in the rejection above, but fails to teach an outcoupling aperture mode matched to a fiber waveguide. However, teaches Mueller this in his patent. The abstract of Mueller discloses that the coupler enables the coupling of mono mode fiber to optical semiconductor devices, with out intervening apparatus for matching the various modes. This means, of course, that the coupler does a requisite matching. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ono in view of Lo and Miyake as taught by Mueller.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ono in view of Lo and Miyake as applied to claims 1, 2, 4 – 9, 12 – 15, 17, 18, 20, 21, 23 and 25 – 28 above, and further in view of Scimpe US 4,743,083 (herein after known as Scimpe). Ono in view of Lo teaches the invention as outlined in the rejection above, but fails to teach a grating with a circular footprint. However, Scimpe teaches this in Fig. 1B of his patent. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ono in view of Lo with a grating having a circular footprint as taught by Scimpe since it is known in the art to do so.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ono in view of Lo and Miyake as applied to claims 1, 2, 4 – 9, 12 – 15, 17, 18, 20, 21, 23 and 25 – 28 above, and further in view of O'Meara US 4,573,157 (herein after known as O'Meara). Ono in view of Lo teaches the invention as outlined in the rejection above, but fails to teach a beamsplitter-outcoupling device. However, O'Meara teaches this in his patent, see Fig. 1 reference numeral 20. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ono in view of Lo as taught by O'Meara since it is known in the art to do so.

Claims 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ono in view of Lo and Miyake as applied to claims 1, 2, 4 – 9, 12 – 15, 17, 18, 20, 21, 23 and 25 – 28 above, and further in view of Eumurian US 4,443,890 (herein after known as Eumurian). Ono in view of Lo and Miyake teaches the invention as outlined in the rejection above, but fails to teach an alternating modulation current. However, Eumurian teaches this limitation in column 2 lines 50 – 55 of his patent. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Ono in view of Lo and Miyake as taught by Eumurian.

Prior Art

The following US patents are being made of record, even though they were not relied upon in this Office Action, for being similar in subject matter, and may be relied upon in any future Office Actions: 4,006,432; 4,743,087; 5,970,081; 6,064,783; 4,896,325; 4,829,535.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gioacchino Inzirillo whose telephone number is 703-305-1967.

The examiner can normally be reached on M-F 8:30AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on 703-308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7721 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Gioacchino Inzirillo
Examiner
Art Unit 2828


October 7, 2002


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